Z-8RB

User Manual

Using this Manual – Legend

⚠ Important   🔍 Tips   ❓ Explanation

Caution

1. The Z-8RB equipped with a laser lighting module, which is a Class 3B invisible laser. DO NOT exposure eyes to the beam within 12 meters or observe the beam by any optical instrument. DO NOT place any inflammable within 20 centimeters in front of the lighting module.
2. When not in use, store the Z-8 in the package box. The recommended storage environment is a relative humidity less than 40% at a temperature of 20±5° C. If the lenses fog up. The water vapor will usually dissipate after turning on the device for a while.
3. Do not place the product under direct sunlight, in areas with poor ventilation, or near a heat source such as a heater.
4. Do not frequently power on/off the product. After it is turned off, wait at least 30 seconds before turning back on, otherwise the product life will be affected.
5. Make sure the pod port and pod surface are free from any liquid before installation.
6. Make sure the pod is securely installed onto the aircraft, the microSD card slot cover is clean and firmly in place.
7. Make sure the pod surface is dry before opening the microSD card slot cover.
8. Do not plug or unplug the microSD card during use.
9. Do not touch the surface of the camera lenses and keep it away from hard objects. As doing so may lead to blurred images and affect the imaging quality.
10. Clean the surface of the camera lenses with a soft, dry, clean cloth. Do not use alkaline detergents.
11. When not receiving valid carrier INS data, the yaw shaft of the pod will drift about 15 degrees per hour because of the earth rotation. To make sure the pod attitude corrects, it is necessary to transmit valid carrier INS data, usually the GNSS should be positioning.

Catalog

Introduction

Synopsis

The Z-8RB equips with a high-accuracy 3-axis gimbal and a 2.07M pixels 360x hybrid zoom camera, which presents scene hundreds of meters away. Combined with the laser lighting module and starlight level night vision function, the Z-8RB can provide a clear image even in complete dark environments. Thanks to the laser range finder, the Z-8RB can provide the location of a target and the distance to it that improves working efficiency. The Z-8RB have AI multi-object detection and tracking function. The pod can intelligently identify the persons and vehicles in the image, and constantly track one of them.

The Z-8RB can be mounted tool-lessly onto unmanned aerial vehicles with its quick-release port. It is able to be applied on multiple industries such as firefighting, forest police, public security, search & rescue and environment protection.

Characteristics

- Features AI multi-object detection and tracking, which can constantly track one of the persons and vehicles intelligently identified in the image.
- Carries a 360x hybrid zoom (30x optical zoom) camera, an 1800m laser range finder and 2 laser lighting modules.
- 3-axis mechanical stabilized structure which is able to spin continually around its yaw axis.
- With the Dual-IMU complementary algorithms with IMU temperature control and carrier AHRS fusion, the Z-8RB provides a stabilization accuracy at $\pm 0.01°$.
- Image supports shooting point coordinate EXIF save.
- Support remote screen projection and docking command platform.
- Can be mounted tool-lessly onto unmanned aerial vehicles with its quick-release port.

Installation

Turn the locking knob to release position, and push the pod along the guide rail at a constant speed until it makes a slight "click". Turn the locking knob to lock position.
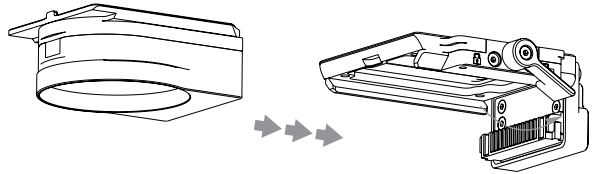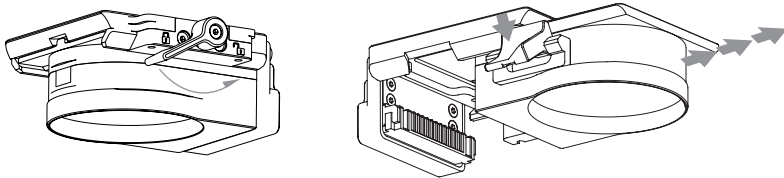
⚠ Make sure the load is installed and locked after installation!

Do not install or remove the load while it is powered on, otherwise it may cause damage to the equipment!
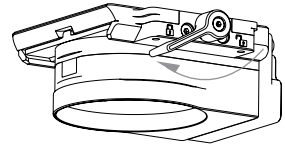
Disassembly

Turn the locking knob to release position. Press and hold the release position on the other side and remove it.

Pod Controls

See "Image Viewing and Pod Control" in the AZ-1R User Manual for control instructions.

Calibration & Firmware Upgrade

## Adjust Software Installation & Settings

1. Install the driver of the config module.
   Win32 runs: CP210xVCPInstaller_x86.exe
   Win64 runs: CP210xVCPInstaller_x64.exe
2. Connect the update port of the gimbal and the computer with the config module.

Update Port
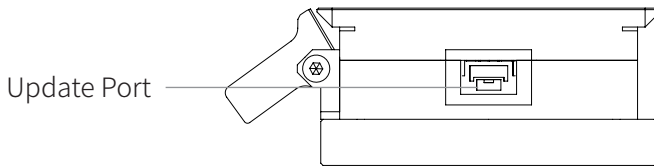
3. Right-click [My Computer]-[Management]-[Device Manager]-[Port] (COM and LPT) to view the port number of the adjustment module.

▲ 🖳 Ports (COM and LPT)
　　🖳 Silicon Labs CP210x USB to UART Bridge (COM71)

4. Run GimbalConfig.exe, select the corresponding serial port number, and click "Open Port".
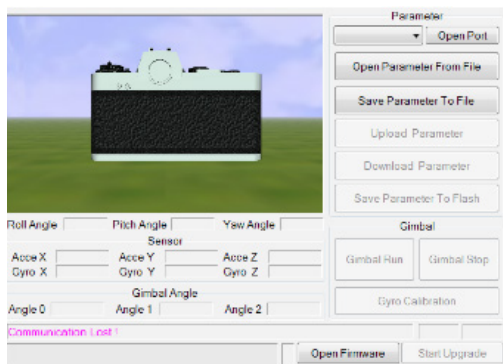
Calibration

Keep the pod still and click "Gyroscope calibration". When the "calibration success" is displayed in the lower left corner of the software, the calibration is complete.

Updating

Firmware upgrade steps:
1. Power on the pod and ensure that the pod and software have been successfully connected.
2. Decompress the firmware upgrade package, click the "Open Firmware" button in the software, select the upgrade package file you just decompressed, and click "Start upgrade" until the progress bar is completed, indicating that the upgrade is successful.

🔍 Just remain the pod still while calibrating. It is not necessary to hold the pod at its neutral position.

🔍 If error occurs during updating, check the cable connection and power supply, and repeat updating.

⚠️ When not receiving valid carrier INS data, the yaw shaft of the pod will drift about 15 degrees per hour because of the earth rotation. To make sure the pod attitude corrects, it is necessary to transmit valid carrier INS data, usually the GNSS should be positioning.
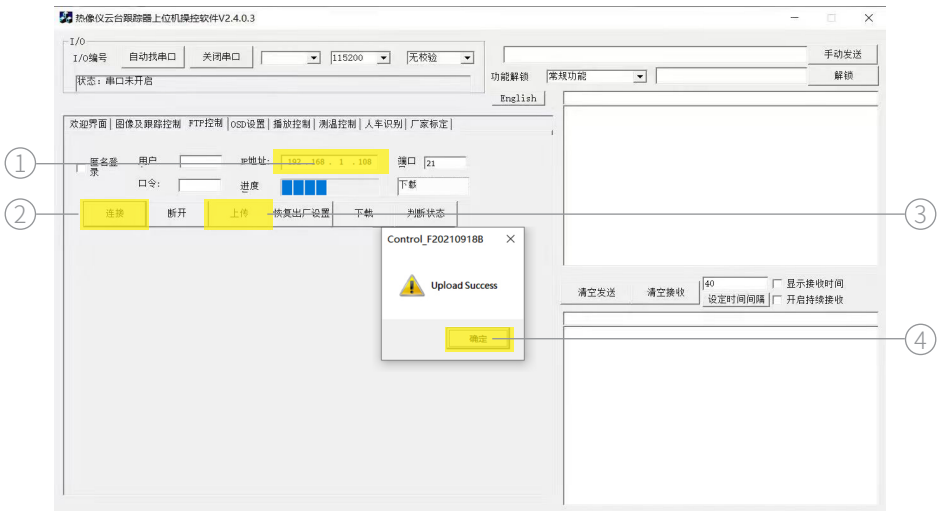
Configuring

Video Stream Address

Main Stream:rtsp: / / 192.168.144.108

Subcode Flow:rtsp: / / 192.168.144.108:554 / stream1
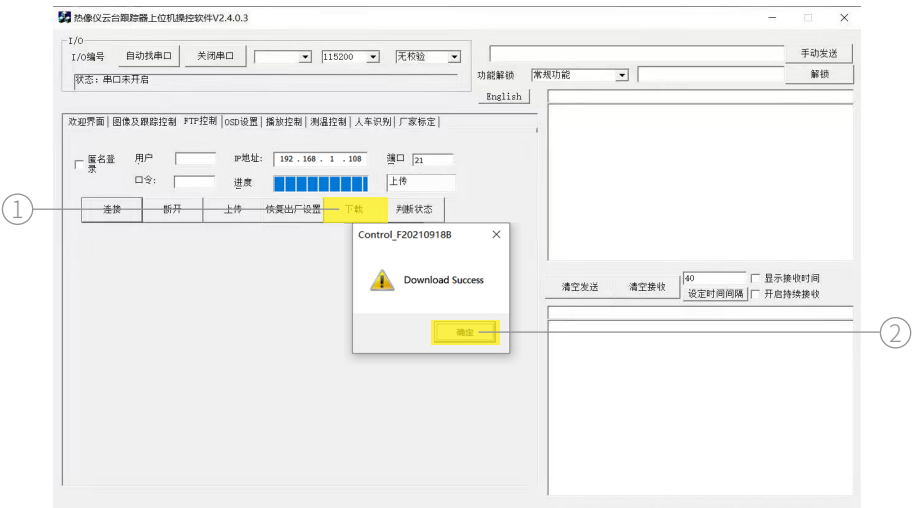
IP Setting

Use Order:

Enter the current IP address of the camera ① -- Click Connect ② -- Upload ③ -- click OK ④
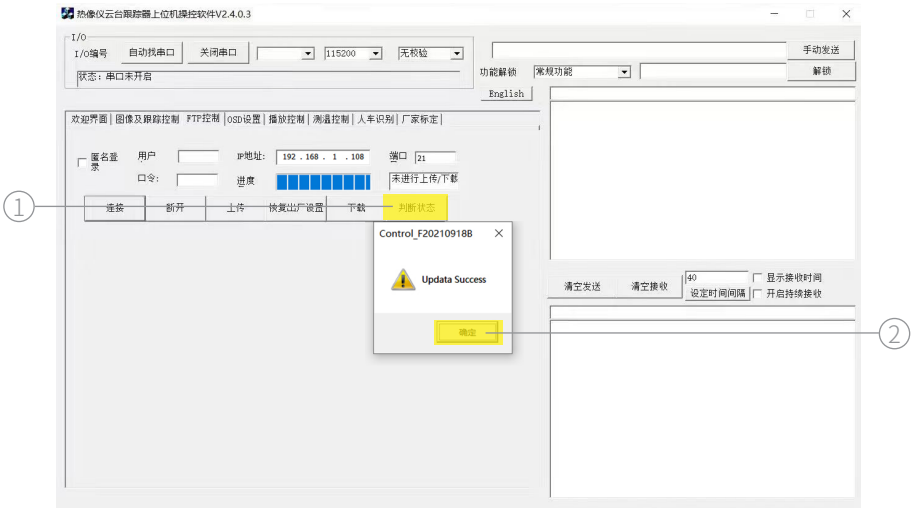
Use Order:

Modify IP (1) - click change (2) - modified optical flow IP address (3) - click on the modify (5) -- change the channel number (4) - modified red outflow of IP addresses (3) - click on modify the 5. 6 - click storage file - shut down the page

Use Order: Click download ① -- Click confirm ②

🔍 If the download fails, restart the debugging software and repeat the preceding steps.
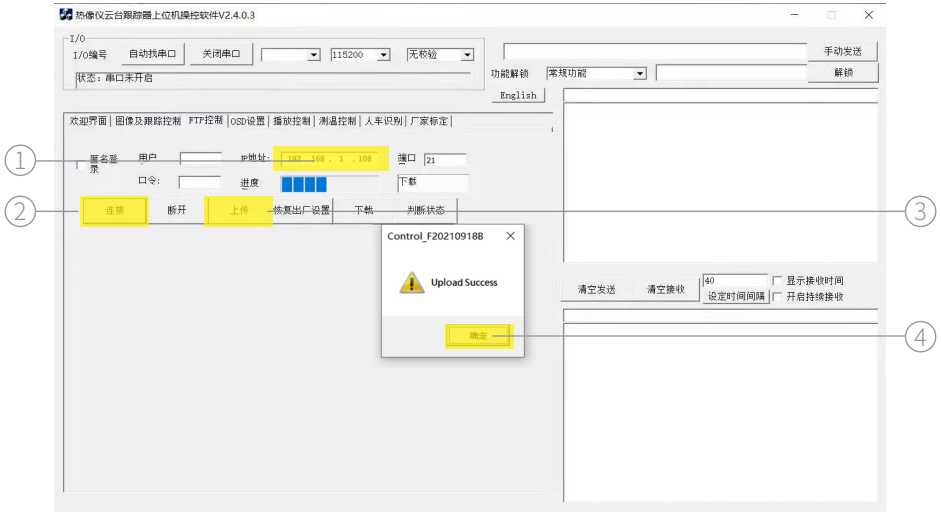
Use Order:

Click to judge the status until the upload succeeds ① -- Click to confirm ②
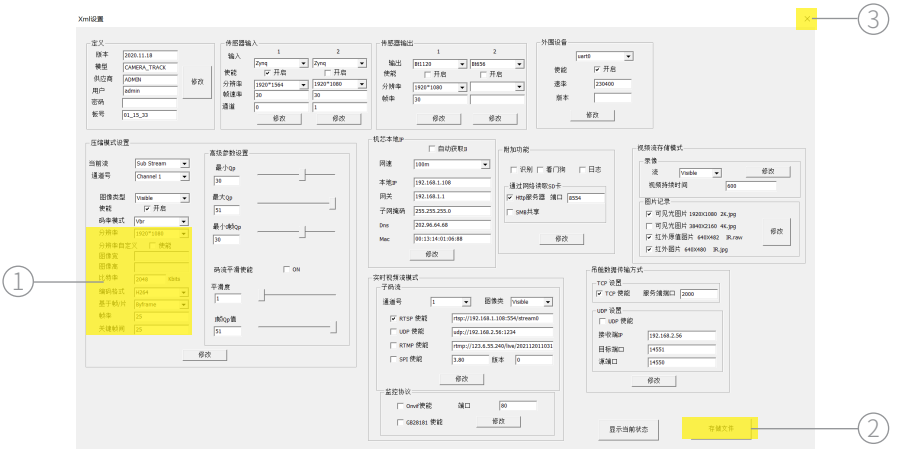
🔍 Power off and restart. Check whether the IP address is changed successfully. If no, repeat the preceding steps.
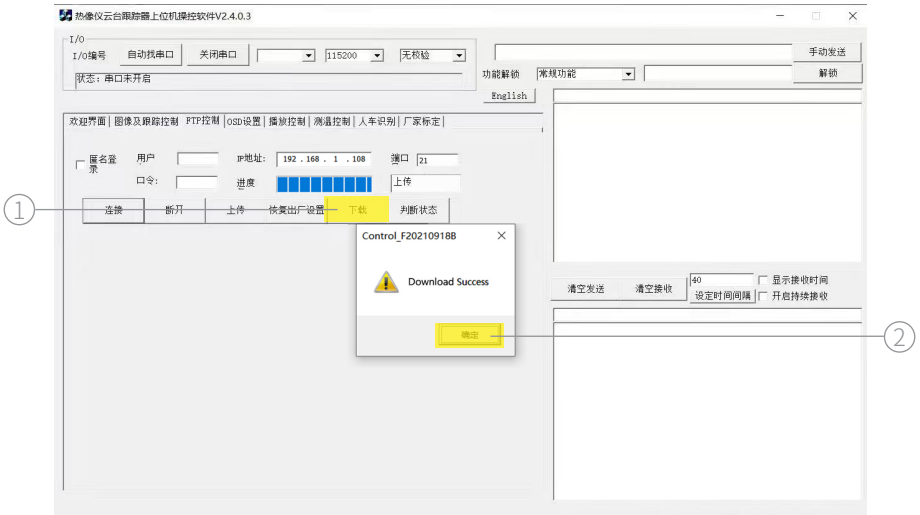
Coding Settings

Use Order:

Enter the current IP address of the camera ① -- Click Connect ② -- Upload ③ -- click OK ④

Use Order:

Modify the corresponding parameter ① -- click Save file ② -- Close the page ③

Use Order: Click download ① -- click OK ②

🔍 If the download fails, restart the debugging software and repeat the preceding steps.
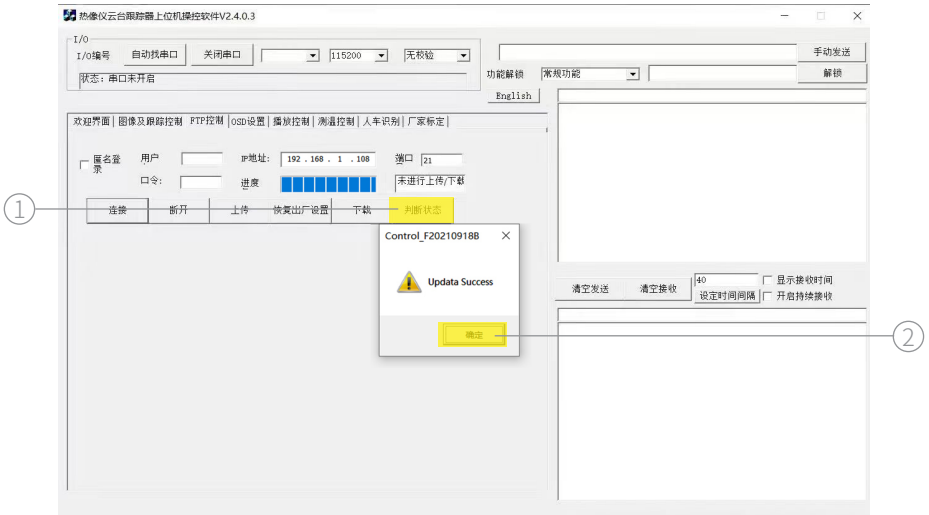
Use order:

Click to judge the status until the upload is successful ① -- Click OK ②

🔍 Power off and restart, use the player to play the main stream, check whether the current image is the modified encoding Settings. Otherwise, repeat the above steps.

Video Playing

Use the Dragonfly Pod display control software, or enter the stream address in the streaming media player such as VLC, EasyPlayer, etc., to play the video. Make EasyPlayer as an example:
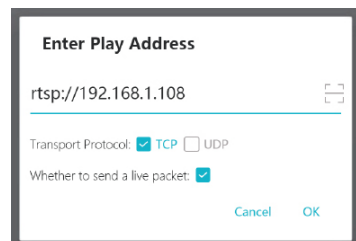
Windows Version

EasyPlayer operation steps are as follows:

1. Decompress the package
2. Open the application: EasyPlayer-RTSP
3. Enter the stream address and click "Play"

Android Version

1. Install the EasyPlayerRTSP APP
2. Open the APP and tap the "+" sign
3. Enter the stream address and click OK

Appendix 1 Specifications

Item		Parameters	
General	Dimensions	150 x 144 x 172mm	
	Weight	870g	
	Operating Voltage	20~53V	
	Power	19W (AVG, ranging & lighting off) 57.6W (Stall, ranging & lighting on)	
	Protection Rating	IP43	
Gimbal	Angular Vibration Range	±0.01°	
	Maximum Controllable Speed	Pitch: ±200° /s, Yaw: ±200° /s	
	Controllable Range	Pitch: -120°~ +60° , Yaw: ±360° constantly	
Zoom Camera	Image Sensor	1/2.8″ CMOS; Effective Pixels: 2.07M	
	Lens	Focal Length: 4.3~129mm HFOV: 63.7°~ 2.3° VFOV: 40°~ 1.4° DFOV: 52.1°~ 2.8°	
	Optical Zoom Rate	30x	
	Equivalent Digital Zoom Rate	12x	
	Aperture	F2~F16	
	Electronic Shutter Speed	1/2~1/2000s	
	Object Detective Distance	EN62676-4:2015	Person[1]: 1947.1m Vehicle[2]: 2559.1m
		Johnson Criteria	Person: 22241.4m Vehicle: 68206.9m

Item		Parameters	
Zoom Camera	Object Identification Distance	EN62676-4:2015	Person: 389.4m
			Vehicle: 511.8m
		Johnson Criteria	Person: 5560.3m
			Vehicle: 17051.7m
	Object Verified Distance	EN62676-4:2015	Person: 194.7m
			Vehicle: 255.9m
		Johnson Criteria	Person: 2780.2m
			Vehicle: 8525.9m
Laser Range Finder	Wavelength	905nm	
	Measuring Range	5-1800m (12m vertical surface with 20% reflectivity)	
	Measuring Accuracy	$\pm0.3m(＜300m)/\pm1.0m(＞300m)$	
	Beam Angle	2.5mrad	
	Measuring Method	Pulse	
	Max Laser Power	＜ 1mW	
	Laser Safety	Class 1M (IEC 60825-1: 2014)	
Laser Lighting Module	Wavelength	850±10nm	
	Laser Power	0.8W x2	
	Beam Angle	8° + 30°	
	Effective Illumination Distance	⩽ 200m	
	Laser Safety	Class 3B (IEC 60825-1:2014)	

[1] Person: 1.8 x 0.5m
[2] Vehicle: 4.2 x 1.8m

Item		Parameters
AI Multi-object Detection & Tracking	Tracking Deviation Refresh Rate	50Hz
	Tracking Deviation Output Delay	$<$ 15ms
	Minimum Target Contrast	5%
	Target Memory Tracking	100frames / 4s
	Object Size	16x16 ~ 128x128px
Image & Video	Output Video Resolution	1080P@30fps
	Store Video Resolution	1080P@30fps
	Image Resolution	1920 x 1080
	Stream Encode Format	H.264, H.265
	Stream Network Protocol	RTSP, UDP
	Supported SD Card	Supports a TF card with a capacity of up to 128GB
Environment	Operating Temperature	-20°C～60°C
	Storage Temperature	-20°C～70°C
	Operating Humidity	$\leqslant$ 85%RH (Non-condensing)